

Claims

What is claimed is:

1. In a displacement control device (1) adapted to move a member (23) relative to a body (7), said displacement control device including a drive means
5 (2, 3) and an emergency actuator (8) arranged mechanically in series with said member, said actuator including a housing (16) and a spring (14) arranged to act between said housing and said member, wherein the improvement comprises:
said actuator including a toggle linkage (9) acting between said housing
and said spring, said toggle linkage having two pivotally-connected links (10, 11)
10 that are adapted to be selectively moved between a collapsed position at which said links are arranged at an acute included angle, and an extended position at which said links are arranged at an obtuse included angle slightly less than 180°, said toggle linkage being arranged such that said spring will be more greatly compressed when said links are in said extended position than when said links
15 are in said compressed position.
2. The improvement as set forth in claim 1 and further comprising a latching means for constraining the links in their extended position as the housing is moved away from the body to open the valve.
3. The improvement as set forth in claim 2 wherein said latching means is
20 magnetically operated.
4. The improvement as set forth in claim 3 wherein said latching means includes at least one latching pin.
5. The improvement as set forth in claim 4 wherein said latching means includes a solenoid having an armature, and wherein said armature is associated

with said latching pin such that said solenoid will move said latching pin to an unlatched position in the absence of electrical power to the solenoid.

6. The improvement as set forth in claim 1 wherein said drive means includes an externally-threaded rotatably-driven screw.

5 7. The improvement as set forth in claim 6 wherein said drive means includes an internally-threaded nut connected to said housing, and wherein said screw is matingly received in said nut such that rotation of said screw will cause linear movement of said housing relative to said body.

8. The improvement as set forth in claim 1 wherein the range of motion of
10 said member is about 30 mm.

9. The improvement as set forth in claim 1 wherein said displacement control device is arranged to cause said member to engage said body with a force of up to about 250 kN.

10. The improvement as set forth in claim 1 wherein said links are arranged
15 at an obtuse included angle of about 172°-177° when said links are in said extended position.

11. The improvement as set forth in claim 1 wherein said spring is arranged to move said links from said extended position to said collapsed position is less than 200 milliseconds.

20 12. The improvement as set forth in claim 1 wherein said latching means includes at least one solenoid armature mounted on one of said links.

13. The improvement as set forth in claim 12 wherein said solenoid has a

magnetic circuit operatively arranged to move said armature.